



Salt Division

19 August 1993

Mr. Frank Brock
Underground Injection Control Section
USEPA Region II
Jacob J. Javits Federal Building
New York NY 10279-0012

Ref: UIC Permit NYU 63860

Dear Mr. Brock:

This letter serves as an application to modify UIC permit NYU 063860, issued to Akzo Salt Inc, to allow the use of a revised well stimulation method. This revision of our operating practice is proposed in order to provide better control of the solution mining process, to attain better recovery of salt reserves, and to create a more structurally stable cavern upon the eventual completion of mining. This application is submitted pursuant to part I(B)(1) of the permit and your letter of 28 May 93.

Description

An oil pad will be placed in solution mining wells to control upward dissolution of salt during solution mining. This method replaces the previously utilized method of hydraulically fracturing the formation to create artificial flow paths between wells. Wells designated for this purpose will be constructed so as to prevent loss of oil into underground sources of drinking water, surface waters, or into the produced brine stream. This method is extremely common, and is used successfully by Akzo Salt Inc. at solution mined brinefields in Michigan and Ohio, and by it's parent company, Akzo Salt and Basic Chemicals nv. in the Netherlands, Germany, and Denmark. Other companies around the country have been using oil or other hydrocarbons to control salt dissolution for many years, particularly in applications where caverns are constructed

Akzo Salt Inc.
Abington
Executive Park
P O Box 352
Clarks Summit,
Pennsylvania
18411-0352
Phone
717/587-5131
Cable: ISCO.
Clarks Summit, PA



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for storage of valuable products, including natural gas, crude petroleum, or refined products.

One well, no. 58, has been constructed to date at Watkins Glen to be equipped with an oil pad. This is the first well drilled at the facility since 1977, and was required to replace older wells that have been depleted over the years. The oil pad method was chosen in order to provide more positive control of leaching than has been attained in the past in fractured wells.

The well's construction was described in the completion report submitted to USEPA on 2 Dec 92. It is equipped with a fully cemented 13-3/8", 61 lb/ft. H-40 8Rd ST&C casing set below the base of the USDW to 179' KB and a fully cemented 9-5/8", 36 lb/ft. K-55 API modified 8Rd ST&C casing set below the top of the salt bed at 2177' KB. Two packerless tubings, one 7" and one 4-1/2", are suspended from the wellhead to depths near the bottom of the salt bed. These tubings will be adjusted during the life of the well as part of the control process. A flanged wellhead, shown in the attached drawing, provides containment for pad oil, injection water, and produced brine. Since we anticipate using this procedure on wells drilled in the future, we ask that the area permit be modified to allow it's use on any properly constructed and operated well, rather than specifically for Well 58 alone.

Oil will initially be placed in the 7" x 9-5/8" annulus; as mining progresses and a cavern develops, more oil will be added periodically to cover the cavern roof with a thin pad to prevent undesired upward growth. Oil was chosen for its low density and immiscibility, which causes it to be statically held in the annulus and on the roof without mixing with the cavern brine. Up to 30,000 gallons of oil may eventually be placed in the well. Oil will be placed using a portable positive displacement pump belonging to an outside contractor with supervision by plant personnel. No permanent on-site storage of oil is planned, outside of the volume held in the well itself. The oil pressure at



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the wellhead is anticipated to be 425 psig during normal solution mining service.

The pad material will be no. 2 fuel oil procured from local sources. A material safety data sheet describing this oil is attached. No wastes of any type are to be used for this purpose. This material is now being used at three other Akzo Salt Inc. brinefields for the same purpose without environmental, safety, or product quality problems.

Mechanical Integrity

Mechanical integrity of Well 58 was demonstrated on 17 Nov 92 by holding a pressure of 331 psig at the wellhead, which corresponds to the highest water injection pressure that can be applied with the plant injection pumps. We propose to repeat the test at 600 psig to account for the difference in operating oil and water pressures. This will be accomplished by pumping oil with the oil injection pump into the annulus of the brine-filled well while the brine discharge valve is kept closed; less than 100 gallons of oil will be needed to provide the target wellhead pressure. After holding this pressure for one hour with less than 5% pressure loss, we will proceed with placement of the oil pad in the well annulus.

Spill Prevention

A Spill Prevention, Control and Countermeasure Plan (SPCC) describing the protection of surface waters from contamination by oil used as padding material was prepared for the New York Department of Environmental Quality and has been accepted by that agency. A copy of this report was provided to your office on 8 March, 1993; a copy of the final version containing some minor revisions is enclosed. Redundant protection is in place to prevent contamination of the ground surrounding the well or of Lake Seneca. This includes the wellhead with valves, a secondary containment system which is to be built prior to any oil emplacement according to the enclosed drawings,



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and the surface brine piping and brine pond, which will contain any oil that would be released from the annulus into the brine return line by the failure of the 7" suspended tubing or by accidental overfilling.

Oil padding was occasionally used at the Watkins Glen brinefield prior to issuance of the UIC permit for the same purpose as we now plan to use it. Unfortunately, the wellheads were not as well designed as that now in place at Well 58, and a spill of no. 2 fuel oil occurred in February, 1975. This was the result of ice building up on and breaking an exposed piece of 1/2" pipe that formed a connection to a pressure valve. The enclosed as-built wellhead drawing shows the gauge measuring the oil pressure to have two shutoff valves, and does not present a danger of breaking off due to the most extreme weather conditions.

We believe that this well stimulation method is appropriate for the Watkins Glen field, and represents good operating practice. The New York Department of Environmental Quality, having responsibility for the protection of surface waters in the state has already granted approval of our use of this method contingent upon acceptance by your office. We plan to build the described secondary containment structure and proceed with the mechanical integrity test and oil emplacement immediately upon issuance of the revised permit. If you require any further information for processing this application, please call me at 717/587-9353.

Sincerely,

Michael J. Schumacher
Brinefield Projects Manager

cc: J.A.C. Atkins
W. Fitzgerald
J. Loose



Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE OF OWNER/AUTHORIZED AGENT: _____

Walt Fitzgerald
Vice President
Production Industrial/Grocery
Akzo Salt Inc.
Abington Executive Park
Clarks Summit, PA 18411
717-587-9510

Attachments:

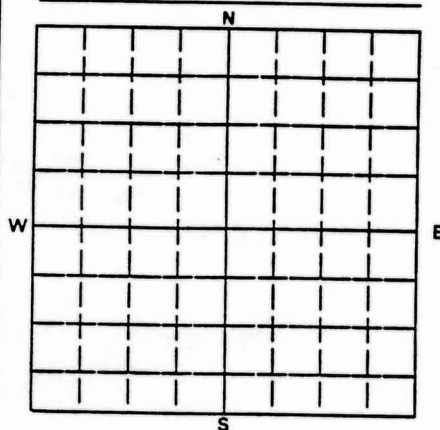
Well 58 completion report (EPA form 7520-10)
Containment pad details drawing
Material Safety Data Sheet
Spill Prevention, Control and Countermeasure Plan

**COMPLETION REPORT FOR BRINE DISPOSAL,
HYDROCARBON STORAGE, OR ENHANCED RECOVERY WELL**

NAME AND ADDRESS OF EXISTING PERMITTEE

Akzo Salt Inc.
P. O. Box 110
Watkins Glen, NY 14891

NAME AND ADDRESS OF SURFACE OWNER

Akzo Salt Inc.
P. O. Box 110
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NY

COUNTY

Schuyler

PERMIT NUMBER

NYU 63860

SURFACE LOCATION DESCRIPTION

¼ OF

¼ OF

¼ SECTION

TOWNSHIP

RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 15000 ft. N of Lat. 42-22'-30"
Location 6700 ft. W of Long. 76-52'-29"
_____ ft. from (N/S) _____ Line of quarter section
and _____ ft. from (E/W) _____ Line of quarter section

WELL ACTIVITY

- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage

TYPE OF PERMIT

- ☐
- Individual
-
- ☒
- Area

Solution Mining—Class III
Estimated Fracture Pressure
of Injection Zone

Number of Wells _____

Anticipated Daily Injection Volume (Bbls)

Average

13,000

Maximum

33,000

Injection Interval

Feet

2642

to Feet

2177

Anticipated Daily Injection Pressure (PSI)

Average

300 psig

Maximum

350 psig

Depth to Bottom of Lowermost Freshwater Formation
(Feet)

5

Type of Injection Fluid (Check the appropriate block(s))

- ☐
- Salt Water
-
- ☒
- Brackish Water
-
- ☒
- Fresh Water
-
- ☐
- Liquid Hydrocarbon
-
- ☐
- Other

Lease Name

Watkins Glen

Well Number

58

Name of Injection Zone

Syracuse Salt

Date Drilling Began

Oct. 7, 92

Date Well Completed

Nov. 27, 92

Permeability of Injection Zone

None

Date Drilling Completed

Oct. 23, 92

Porosity of Injection Zone

None

CASING AND TUBING

OD Size	Wt/Ft — Grade — New or Used	Depth	Sacks	Class	Depth	Bit Diameter
13-3/8"	61 H40 New	179	150	Class 'A' w/ 3% CaCl ₂	190	17-1/2"
9-5/8"	36 J55 New	2177	575	50/50 Pozmix	2642	12-1/4"
7"	20 K55 New	2613	200	w/3% Gel, 3% CaCl ₂		
4-1/2"	10.5 K55 Used	2632	None	Class 'A' salt		12-1/4"
			None	Saturated		12-1/4"

INJECTION ZONE STIMULATION

WIRE LINE LOGS, LIST EACH TYPE

Interval Treated	Materials and Amount Used	Log Types	Logged Intervals
		gamma ray, neutron, density, caliper	Surf - 2642
		cement bond log	Surf - 2165

Complete Attachments A — E listed on the reverse.

CERTIFICATION

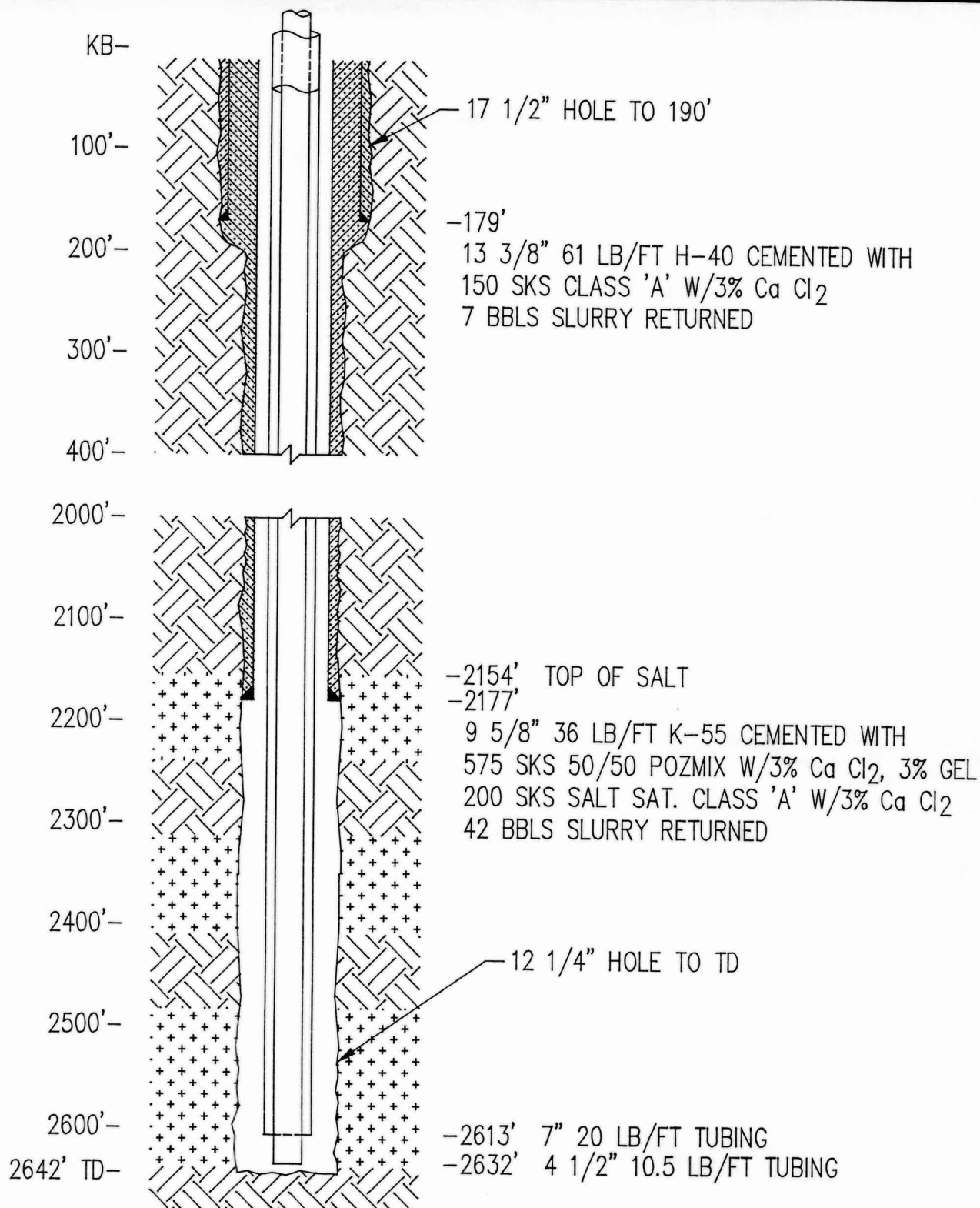
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32).

NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Brinefield Project Manager

DATE SIGNED

2 Dec 92



DATE SPUDDED: 10-7-92
 DATE COMPLETED: 11-27-92
 DRILLING PERMIT NO. 06728
 UIC PERMIT NO. NYU 63860
 API NO. 31-097-21467
 GRD. ELEV. 812.7'
 K.B. ELEV. 826.0'

AKZO SALT INC. ENGINEERING DEPARTMENT CLARKS SUMMIT, PA. 18411-0352		INDEX NO	2000X17
		DWG NO	2000X17
TITLE WELL NO. 58		PROJECT NO	2000
		DATE 12-2-92	SCALE NONE
LOCATION WATKINS GLEN, NY		DWN M.P.B.	CHKD <i>K</i>
		APPROVED <i>W.P.</i>	

United Refining Company • Petroleum Products

MATERIAL SAFETY DATA SHEET

DATE: 10/1/85

Accepted by O.S.H.A. as essentially similar to O.S.H.A. form 20.

Trade Name and Synonyms <u>No. 2 Diesel Fuel (Home Heating)</u>				
Manufacturer's Name <u>United Refining Company</u>		Emergency Telephone No. <u>814-723-1500</u>		
Address <u>P.O. Box 780, Warren, PA 16365</u>				
Chemical Name and/or Family or Description <u>Petroleum Hydrocarbon</u>				
Hazardous Classification	Ingredient	Percent	PEL	TLV (PPM)
CAS #7704-34-9	Sulphur	0.50		
CAS #8002-05-9	Oil Mist			5 mg/m ³
CHEMICAL AND PHYSICAL PROPERTIES				
Boiling Point (°F) <u>340 - 675</u>		Vapor Pressure (mmHg) <u>N/A</u>		
Specific Gravity (H ₂ O=1) <u>< 0.86</u>		Vapor Density (Air=1) <u>N/A</u>		
Appearance and Odor <u>Clear, Bright Liquid, Mild Petroleum Odor</u>				
pH of undiluted product _____		Solubility <u>Negligible</u>		
Percent Volatile by Volume <u>NIL</u>		Evaporation (Butyl Acetate=1) <u>< 1</u>		
Viscosity <u>1.9 - 4.1 CST @ 104°F</u>		Other _____		
Hazardous Polymerizations _____ Occur _____ Do not occur <u>X</u>				
The Material Reacts Violently With:				
Air _____ Water _____ Heat _____ Strong Oxidizers <u>X</u> Others _____ None of These _____				
FIRE PROTECTION INFORMATION				
Ignition Temp. °F <u>> 500</u>		Flash Point °F (Method) <u>125 Pensky-Marten</u>		
Flammable Limits% Lower <u>0.6</u>		Upper <u>7.5</u>		
Products Evolved When Subjected to Heat or Combustion: <u>May form toxic materials. Carbon Dioxide and Carbon Monoxide.</u>				
Recommended Fire Extinguishing Agents and Special Procedures: <u>Regular Foam, Carbon Dioxide, or Dry Chemical. Water spray for extinguishment and cooling. Use self contained breathing apparatus and protective clothing.</u>				
Unusual or Explosive Hazards: <u>Never use open flame near liquid or vapors. Remove all ignition sources.</u>				

OCCUPATIONAL CONTROL PROCEDURES

Protective Equipment (Type) Self Contained Breathing Apparatus.

Eye: Protective Devices. Flush With Water for 15 min.

Skin: Wash Affected Area With Soap and Water.

Inhalation: Remove To Fresh Air and Restore Breathing.

Swallowing: Do Not Induce Vomiting. Aspiration Hazard. Contact Physician.

First Aid: As Above. Seek Prompt Medical Assistance.

ENVIRONMENTAL PROTECTION

Waste Disposal Method:

Contain spill with diking and sorbent materials. Dispose of according to EPA and other Environmental Agencies.

Procedures in Case of Breakage or Leakage:

Remove sources of heat or ignition. Provide adequate ventilation. Use water spray to disperse vapors. Use fire fighting foam to blanket spill. Keep out of surface water and sewers.

Remarks:

PHYSIOLOGICAL EFFECTS

Effects of Exposure

Acute:

Eyes Hyperemia and Conjunctiva.

Skin Irritation, Dermatitis, Defatting.

Respiratory System Some Burning in Throat & Lungs.

Chronic:

Other:

Sensitization Properties:

Skin: Yes _____ No X Unknown _____ Respiratory: Yes _____ No X Unknown _____

ADDITIONAL COMMENTS

Dot Classification: Combustible Liquid Dot I.D. No. UN 1993.

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information. United Refining Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Michael J. Hunsbaker
APPROVAL
-- 10/3/85
DATE